

REMARKS

Claims 1, 3-8, and 10-14 are pending. Claims 2 and 9 have been canceled. The applicant respectfully requests reconsideration and allowance of this application in view of the above amendments and the following remarks.

Claims 1, 2, 4, 6, 8, 9, 11, and 13 were rejected under 35 USC 103(a) as being unpatentable over US 4523892 to Mitchell *et al.* (hereafter, Mitchell) and US 6405844 to Takamatsu. The applicant respectfully requests that this rejection be withdrawn for the following reasons.

The invention relates to a technique for solving a problem specific to a work vehicle that drives a drive wheel and variable displacement hydraulic pumps for operating a hydraulic actuator. In other words, the invention relates to a work vehicle, such as a wheel loader, in which the engine drives a driving wheel for traveling and variable displacement hydraulic pumps for operating a hydraulic actuator. The problem being solved is explained in detail in the background section of the application.

As suggested in the background section of this application, in such a vehicle, since the traveling speed is adjusted according to the degree of depression of the accelerator pedal, the engine maintains the low idle speed when the vehicle speed is zero. If the low idle speed setting is raised, fuel consumption during the idling state would increase, and a stronger creep would occur at the torque converter. Therefore, it is undesirable to increase the low idle speed setting.

Additionally, unlike a general work vehicle, the work vehicle that is the subject of the problem being solved operates its work equipment when the vehicle is halted. In other words, as compared with a hydraulic shovel or other general work vehicle, the work vehicle that is the

subject of the problem being solved operates its work equipment when the target engine speed is the low idling speed.

When the work machine operates its work equipment when the vehicle is stationary, the engine is required to increase the engine torque in correspondence with a rapid increase in the hydraulic load. However, if the hydraulic load rapidly increases at the low idle speed, the increase in the engine torque becomes slower, as compared with the increase in the hydraulic load at the high idling speed. See paragraph 0006 of the publication of this application.

Accordingly, in the field of such work vehicles, there has existed a problem that, when the work vehicle raises a loaded bucket (the boom and bucket) while turning the steering in the idling state (in the halted state), the increase in the engine torque cannot keep up with the rapid increase in the hydraulic load, and then the engine stalls.

To solve this problem, claims 1 and 8 recite a control such that the absorption torque is reduced only when the engine speed is decreased to a predetermined threshold value or lower. Further, claims 1 and 8 recite that the predetermined threshold value is set to an engine speed at which it is determined that there is a risk that the engine will stall.

On the other hand, Mitchell fails to disclose or suggest that the engine drives a driving wheel. It appears that the vehicle of Mitchell travels by means of a variable displacement hydraulic pump. Thus, a basic structure of the general work vehicle of Mitchell is completely different from a work vehicle in which the engine drives a driving wheel via the torque converter, as claimed.

With a general work vehicle like that of Mitchell, the standby speed of the engine is usually set on the basis of the capacity of the variable displacement hydraulic pump. Thus, if the work equipment has appropriate settings, the increase in the hydraulic load caused by the

operation of the work equipment is not very rapid, and the engine does not stall. Thus, Mitchell fails to mention avoidance of an engine stall and fails to recognize the problem being solved by the claimed invention.

Additionally, in Mitchell, if the actual engine speed deviates from the target engine speed, the pump capacity or fuel supply is controlled to maintain the desired relationship between the engine speed and the pump capacity. Such a control is significantly different from that of the present invention.

Takamatsu is relied on to show a work vehicle that drives driving wheels with a torque converter. However, even if Takamatsu is combined with Mitchell, the resulting combination fails to include the feature of setting the predetermined threshold value to an engine speed at which it is determined that there is a risk that the engine will stall. Since neither Mitchell nor Takamatsu discloses the claimed stall prevention technique, the combination of Mitchell and Takamatsu cannot include the claimed stall prevention technique.

Further, it would not have been obvious to combine Mitchell and Takamatsu, because the engine of Mitchell is controlled to run at a target speed. See col. 3, lines 14-21. Such a control is not appropriate for driving travel wheels with a torque converter. Thus, if one combines Mitchell and Takamatsu, the engine speed control system must be entirely redesigned to accommodate the driving of a torque converter. Thus, the combination of Mitchell and Takamatsu would necessitate a redesigned engine speed control system that would scarcely resemble the one shown by Mitchell that is relied on to support the rejection. Thus, the combination of Mitchell and Takamatsu would not have been obvious to one of ordinary skill in the art.

Claims 3 and 10 were rejected under 35 USC 103(a) as being unpatentable over Mitchell and Takamatsu and US 6176083 to Ikari. Claims 3 and 10 depend on claims 1 and 8 and are thus considered to be patentable for at least the reasons given above.

Claims 5 and 12 were rejected under 35 USC 103(a) as being unpatentable over Mitchell and Takamatsu and US 6170262 to Yoshimura *et al.* (hereafter, Yoshimura). Claims 5 and 12 depend on claims 1 and 8 and are thus considered to be patentable for at least the reasons given above.

In an interview conducted on 28 April 2010, the undersigned discussed these claim amendments with examiner Lazo. Examiner Lazo said that he agreed that Mitchell does not mention engine stalling. Examiner Lazlo said that he would need to reconsider the rejection and conduct further searching if these amendments were submitted.

In view of the foregoing, the applicant submits that this application is in condition for allowance. A timely notice to that effect is respectfully requested. If questions arise, the examiner is invited to contact the undersigned by telephone.

If there are any problems with the payment of fees, please charge any underpayments and credit any overpayments to Deposit Account No. 50-1147.

Respectfully submitted,
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